Control Box with Status for Märklin Railway Points

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The model rail manufacturer Märklin produces the turnout mechanism (or points) type 74490 for C track, the 7549 for K track (H0 gauge) and also the 5625 (1 gauge) all fitted with limit switches. The circuit here shows a control box to interface to these mechanisms and also display the status of the turnout using LEDs.

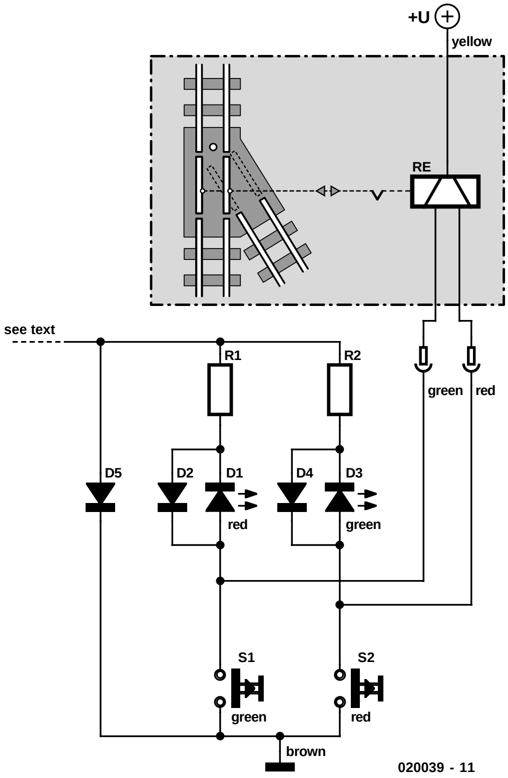
All these turnouts are fitted with two actuating coils, when energy is supplied to coil L1 the turnout moves to the ‘straight ahead’ position while energising L2 moves them so that the train ‘turns out’ onto a branch line. The standard Märklin control box for controlling these devices is fitted with a green push button to activate L1 and a red push button for L2. This colour convention is also used here for connections. Yellow indicates the power supply connection and brown the earth connection.

The limit switches interrupt power to the coils when the turnout reaches the end of its travel. These ensure that the coils do not become overloaded and also divert the supply to the other coil, enabling the points to be moved back later.

When the pushbutton is pressed, current flows through the coil and also the status LED. The only other additional components are the LED current limiting resistors, protection diodes and a rectifier.

The low-current LEDs require an additional 2 mA (red) or 4 mA (green) from the transformer. Series resistors R1 and R2 limit current through the LEDs while D1 and D2 protect the LEDs from the back-emf generated when current through the coil is interrupted.

Diode D3 rectifies the supply to both LEDs and can also supply additional LEDs if more than one turnout control is built. A feature of the circuit is that the status LED will illuminate when its corresponding pushbutton is pressed even if power to its coil is not connected through the limit switch. This does not affect operation but can be remedied if necessary by fitting separate rectifiers for each coil.



Additional low-current or standard LEDs or even optocouplers can be added in series with the LEDs if more status indicators are needed but it will be necessary to change the value of the series resistors to suit. A conventional control box like the Märklin 7272 can be substituted for the pushbuttons shown in the circuit and the LEDs can be fitted to provide visual positional feedback.

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